

Ettore Caracciolo's Grant - 2014

Submission Date	43123
Select the subject of your research project	EAB: Experimental Analysis of Behavior;
Title (max 50 characters)	Solutions for the (near) Future: SmartList
Abstract (max 1000 characters). English or Italian are accepted	<p>An increasing number of researches in Aviation Safety indicates that the focus of future research programs should move from the enhancement of technological resources to people's interaction with increasingly complex systems. The safety question no longer concerns aircraft industries that have reached levels of security still unthinkable in other fields. Therefore Behavior-Based Safety interventions are to be considered the most effective, focused on the behavior of the pilot and all the people involved at different levels in flight safety. This result can be reached with the application of Behavior Analysis principles through new generation Information Technologies. The aim of the present experimental project is to test the efficacy of using contingent and specific feedbacks on the optimization of decision making and to build fluency in direction of an improvement in Aviation Safety, through a better technological implementation of low cost/high impact innovative solutions.</p>
Scientific Impact (20 points). English or Italian are accepted	<p>The aim of the present research project is to test the effect of contingent graphic feedbacks on the performance delivered through a new generation app for smartphones and tablets both on the individual and group performance in pilots/cadets. The procedure involves the use of specific cues (NFC Tags) to help participants emit the correct response and contingent feedbacks both for daily performance and correct response trends that can be delivered through graphics directly on the smartphone or tablet. The procedure is not applied throughout all the checklist but only in different flight phases randomly assigned providing cadets with a MET (multiple exemplar training) aimed to foster the functional extension of the training to the other phases and, more in general, to the safety behavior. The importance of checklist use has been already proven in a large amounts of research studies but both the technological implementation and the MET training represent a true innovation.</p>
Social and Life Quality Impact (20 points). English or Italian are accepted	<p>The most recent aircraft accidents, particularly the Air France flight 447, have shown that safety interventions have to focus on the behavior of every single person involved in aviation, first of all pilots. B-BS has proven the efficacy of behavioral technologies in the promotion of safety related to the working place in a great number of different settings. What aviation offers to Behavior Analysis today is a wide area in which new solutions can be proven effective. The proposed project has a high social impact as it allows to</p>

improve safety in general aviation with future potential developments both in commercial and military aviation. Moreover the present experimental protocol can lead to an important progress in behavioral modification in high-risk contexts (an example is the use of checklist in healthcare). A similar procedure can be easily applied in production chains and in any other context in which the use of the checklist may be extremely important to safety promotion. Also the present project is based on a new paradigm in which the use of open IT solutions can change the way to achieve a performance goal: in fact "SmartList" allows a new way of communicating and sharing positive practices in a social context, through the creation of an open social network.

**Innovative Features (20 points).
English or Italian are accepted**

The intervention is based on the use of an application (app) for smartphones and tablets that is currently being developed, named "SmartList", a smart interactive flight checklist. The flight checklist can be defined as a set of behavioral rules that describe a series of actions required of the pilot in order to configure the aircraft in the appropriate manner in each phase of flight. This app will allow to combine collected data with time and place for a closer monitoring of the performance of accuracy in checklist completion before and during a flight, providing contingent and specific feedback to the pilot.

The use of "SmartList" will also provide an important prevention with the signal "go back and repeat" in case of an omission of a control step or procedure. It will also allow to send data on the global performance of the pilot to the personal computer/mobile phone of the instructor or the person responsible for Flight Safety.

**Experimental Design (20 points).
English or Italian are accepted**

The present study combines a traditional single subject design of behavior analytic approach with a group design to help extend the findings to larger groups. Subjects will be previously randomly assigned to two conditions: "SmartList" condition and TAU condition. In each conditions data will be collected previous starting the intervention and then retested at the end of the training and after a 4 months follow-up. The dependent variable is the number of checklist items that are completed in each flight session (overall data) and in each phase of the flight. In both conditions, subjects will be video recorded during the flight session.

Every subject in the "SmartList" condition becomes a participant in a multiple probe / multiple baselines design. Paired in groups of three-four participants, subjects will have the same training of the control group but will receive contingent feedbacks through self-monitoring in specific sections of the safety checklist. The app will collect data on checklist completion performance and give an immediate feedback to the cadets. For an item to be considered "correct" subjects will be required to perform properly the necessary action or check at the appropriate phase of flight. During the pre-flight inspection, which is a series of controls that the pilot has to do before each flight to check that the airplane is properly configured to the flight, it'll be possible to have an even more effective control on cadet's performance through the use of NFC (Near Field Communication) Tags, cues placed in areas of the aircraft where safety checks are required. At the end each flight session, "SmartList" will give the cadets an individualized graphic feedback on their performance both overall and specific per phase.

